

Pending Claims

The following listing of claims replaces all prior versions and listings of claims in this application:

Listing of Claims

1. (Original) A device for heat sealing at least two thermoplastic films together, the device comprising:

front and rear opposing jaws moveable between an open position defining a zone for inserting the at least two films between the front and rear jaws and a closed position in which the front and rear jaws are proximate each other to compress the at least two thermoplastic films together, the rear jaw including a resilient portion facing the front jaw, the resilient portion having a given cross-sectional thickness;

a rear jaw release sheet adjacent to the resilient portion of the rear jaw, the rear jaw release sheet including an unreinforced release material;

a front jaw release sheet positioned between the insertion zone and the front jaw when the front and rear jaws are in the open position, the front jaw release sheet including an unreinforced release material;

a heating element positioned between the front jaw release sheet and the front jaw, the heating element having a cross-sectional thickness no less than about 0.55 times the cross-sectional thickness of the resilient portion; and

at least one recoiler having a first end attached to the front jaw release sheet and a second end attached to the front jaw, wherein the recoiler disengages the front jaw release sheet from the heating element when the front and rear jaws are in the open position.

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2. (Original) The device of claim 1 wherein the cross-sectional thickness of the heating element is no less than the cross-sectional thickness of the resilient portion.

3. (Original) The device of claim 1 wherein the cross-sectional thickness of the heating element is no less than about 2.0 times the cross-sectional thickness of the resilient portion.

4. (Previously Presented) The device of claim 1 wherein the heating element is at least partially embedded in the front jaw when the front and rear jaws are in the open position.

5. (Original) The device of claim 1 for heat sealing at least two thermoplastic films having a given transverse width, wherein when the front and rear jaws are in the closed position, the front jaw release sheet conforms to greater than 20% of the surface area of the heating element that is within the transverse width of the at least two thermoplastic films.

6. (Original) The device of claim 1 wherein the unreinforced release material is a fluoroplastic material.

7. (Original) A method of simultaneously sealing and severing at least two thermoplastic films, the method comprising:

inserting the at least two thermoplastic films in the insertion zone of the device of claim 1;

moving the front and rear jaws to the closed position whereby the at least two thermoplastic films are pressed together between the front and rear jaws;

applying an electrical impulse to the heating element to increase the temperature of the heating element to a point sufficient to simultaneously sever and heat seal the at least two thermoplastic films; and

discontinuing the electrical impulse to the heating element while the front and rear jaws are in the closed position to set the heat seal.

8. (Original) The method of claim 7 wherein the total thickness of the at least two thermoplastic films is no more than about 0.004 inches.

9. (Canceled)

10. (Amended) The device of claim 21 9 wherein the front jaw release sheet includes an unreinforced release material.

11. (Original) The device of claim 10 wherein the unreinforced release material includes a fluoroplastic material.

12. (Previously Presented) A device for heat sealing at least two thermoplastic films together, the device comprising:

front and rear opposing jaws moveable between an open position defining a zone for inserting the at least two films between the front and rear jaws and a closed position in which the front and rear jaws are proximate each other to compress the at least two thermoplastic films together, the rear jaw including a resilient portion facing the front jaw;

a front jaw release sheet positioned between the insertion zone and the front jaw when the front and rear jaws are in the open position;

a heating element positioned between the front jaw release sheet and the front jaw, wherein the front jaw release sheet engages the heating element when the front and rear jaws are in the closed position and disengages from the heating element when the front and rear jaws are in the open position; and

at least one spacer attached to the front jaw release sheet, wherein the front jaw release sheet is disengaged from the heating element when the front and rear jaws are in the open position.

13. (Original) The device of claim 12 wherein at least one spacer includes a recoiler.

14. (Original) The device of claim 13 wherein the recoiler includes:

a first end attached to the front jaw release sheet; and
a second end attached to the front jaw.

15. (Amended) The device of claim 21 9 wherein the surface of the resilient portion of the rear jaw facing the front jaw includes a release characteristic.

16. (Amended) The device of claim 21 9 further comprising a rear jaw release sheet adjacent to the resilient portion of the rear jaw.

17. (Original) The device of claim 16 wherein the rear jaw release sheet includes an unreinforced fluoroplastic material.

18. (Amended) The device of claim 21 9 wherein:

the heating element and the resilient portion of the rear jaw each have a given cross-sectional thickness; and

the cross-sectional thickness of the heating element portion that is unembedded in the front jaw is no less than about 0.55 times the cross-sectional thickness of the resilient portion.

19. (Previously Presented) The device of claim 18 wherein the cross-sectional thickness of the heating element portion that is unembedded in the front jaw is no less than the cross-sectional thickness of the resilient portion.

20. (Previously Presented) The device of claim 18 wherein the cross-sectional thickness of the heating element portion that is unembedded in the front jaw is no less than about twice the cross-sectional thickness of the resilient portion.

21. (Amended) The device of claim 9 A device for heat sealing at least two thermoplastic films together, the device comprising:

front and rear opposing jaws moveable between an open position defining a zone for inserting the at least two films between the front and rear jaws and a closed position in which the front and rear jaws are proximate each other to compress the at least two thermoplastic films together, the rear jaw including a resilient portion facing the front jaw;

a front jaw release sheet positioned between the insertion zone and the front jaw when the front and rear jaws are in the open position; and

a heating element positioned between the front jaw release sheet and the front jaw, wherein the front jaw release sheet engages the heating element when the front and rear jaws are

in the closed position and disengages from the heating element when the front and rear jaws are in the open position and wherein the resilient portion of the rear jaw faces the heating element so that the resilient portion conforms to the shape of the heating element when the front and rear jaws are in the closed position, wherein the heating element is at least partially embedded in the front jaw when the front and rear jaws are in the open position.

22. (Previously Presented) A device for simultaneously heat sealing and severing at least two thermoplastic films, the device comprising:

front and rear opposing jaws moveable between an open position defining a zone for inserting the at least two films between the front and rear jaws and a closed position in which the front and rear jaws are proximate each other, the rear jaw including a resilient portion facing the front jaw, the resilient portion having a given cross-sectional thickness;

a front jaw release sheet positioned between the insertion zone and the front jaw when the front and rear jaws are in the open position; and

a heating element positioned between the front jaw release sheet and the front jaw, wherein the cross-sectional portion of the heating element that is unembedded in the front jaw is no less than about 0.55 times the cross-sectional thickness of the resilient portion.

23. (Original) The device of claim 22 wherein the cross-sectional thickness of the heating element is no less than the cross-sectional thickness of the resilient portion.

24. (Original) The device of claim 22 wherein the cross-sectional thickness of the heating element is no less than about 1.5 times the cross-sectional thickness of the resilient portion.

25. (Original) The device of claim 22 wherein the cross-sectional thickness of the heating element is no less than about twice the cross-sectional thickness of the resilient portion.

26. (Original) The device of claim 22 wherein the front jaw release sheet includes an unreinforced release material.

27. (Previously Presented) A device for heat sealing at least two thermoplastic films together, the device comprising:

front and rear opposing jaws moveable between an open position defining a zone for inserting the at least two films between the front and rear jaws and a closed position in which the front and rear jaws are proximate each other, the rear jaw including a resilient portion facing the front jaw, the resilient portion having a given cross-sectional thickness;

a front jaw release sheet positioned between the insertion zone and the front jaw when the front and rear jaws are in the open position;

a heating element positioned between the front jaw release sheet and the front jaw, the heating element having a cross-sectional thickness no less than about 0.55 times the cross-sectional thickness of the resilient portion; and

at least one spacer attached to the front jaw release sheet, wherein the front jaw release sheet is disengaged from the heating element when the front and rear jaws are in the open position.

28. (Original) The device of claim 27 wherein at least one spacer includes a recoiler.

29. (Original) The device of claim 28 wherein the recoiler includes:

a first end attached to the front jaw release sheet; and
a second end attached to the front jaw.

30. (Original) The device of claim 22 wherein the surface of the resilient portion of the rear jaw facing the front jaw includes a release characteristic.

31. (Original) The device of claim 22 further comprising a rear jaw release sheet adjacent to the resilient portion of the rear jaw.

32. (Original) The device of claim 31 wherein the rear jaw release sheet includes an unreinforced release material.

33. (Amended) A device for heat sealing at least two thermoplastic films together, the device comprising:

front and rear opposing jaws moveable between an open position defining a zone for inserting the at least two films between the front and rear jaws and a closed position in which the front and rear jaws are proximate each other to compress the at least two thermoplastic films together, the rear jaw including a resilient portion facing the front jaw;

a front jaw release sheet comprising an unreinforced release sheet positioned between the insertion zone and the front jaw when the front and rear jaws are in the open position, the front jaw unreinforced release sheet including an unreinforced release material consisting essentially of fluoroplastic release material; and

a heating element positioned between the front jaw release sheet and the front jaw.

34. (Canceled)

35. (Previously Presented) A device for heat sealing at least two thermoplastic films together, the device comprising:

front and rear opposing jaws moveable between an open position defining a zone for inserting the at least two films between the front and rear jaws and a closed position in which the front and rear jaws are proximate each other to compress the at least two thermoplastic films together, the rear jaw including a resilient portion facing the front jaw;

a front jaw release sheet positioned between the insertion zone and the front jaw when the front and rear jaws are in the open position, the front jaw release sheet including an unreinforced release material;

a heating element positioned between the front jaw release sheet and the front jaw; and

at least one spacer attached to the front jaw release sheet, wherein the front jaw release sheet is disengaged from the heating element when the front and rear jaws are in the open position.

36. (Original) The device of claim 35 wherein at least one spacer includes a recoiler.

37. (Original) The device of claim 36 wherein the recoiler includes:

a first end attached to the front jaw release sheet; and

a second end attached to the front jaw.

38. (Original) The device of claim 33 wherein the surface of the resilient portion of the rear jaw facing the front jaw includes a release characteristic.

39. (Original) The device of claim 33 further comprising a rear jaw release sheet adjacent to the resilient portion of the rear jaw.

40. (Original) The device of claim 39 wherein the rear jaw release sheet includes an unreinforced fluoroplastic material.

41. (Previously Presented) The device of claim 33 wherein the heating element is at least partially embedded in the front jaw when the front and rear jaws are in the open position.

42. (Previously Presented) A device for simultaneously heat sealing and severing at least two thermoplastic films, the device comprising:

front and rear opposing jaws moveable between an open position defining a zone for inserting the at least two films between the front and rear jaws and a closed position in which the front and rear jaws are proximate each other to compress the at least two thermoplastic films together, the rear jaw having a resilient portion facing the front jaw, the resilient portion having a given cross-sectional thickness; and

a heating element positioned between the insertion zone and the front jaw, wherein the cross-sectional portion of the heating element that is unembedded in the front jaw is no less than about 0.55 times the cross-sectional thickness of the resilient portion.

43. (Original) The device of claim 42 wherein the cross-sectional thickness of the heating element is no less than the cross-sectional thickness of the resilient portion.

44. (Original) The device of claim 42 wherein the cross-sectional thickness of the heating element is no less than about twice the cross-sectional thickness of the resilient portion.

45. (Previously Presented) The device of claim 42 wherein the heating element is at least partially embedded in the front jaw when the front and rear jaws are in the open position.

46. (Original) The device of claim 42 wherein the surface of the resilient portion of the rear jaw facing the front jaw includes a release characteristic.

47. (Original) The device of claim 42 further comprising a rear jaw release sheet adjacent to the resilient portion of the rear jaw.

48. (Amended) The device of claim 21 9 for heat sealing at least two thermoplastic films having a given transverse width, wherein when the front and rear jaws are in the closed position, the front jaw release sheet conforms to greater than 20% of the surface area of the heating element that is within the transverse width of the at least two thermoplastic films.